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(54) **ELECTROPHORETIC DISPLAYS USING NANOPARTICLES**

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(52) **U.S. Cl.** **359/296**; 345/107

(58) **Field of Search** 359/296, 529, 359/530, 536, 538, 539, 541; 349/86, 89; 345/107, 86

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(57) **ABSTRACT**

An electrophoretic display comprises a fluid and a plurality of nanoparticles having diameters substantially less the wavelengths of visible light such that, when the nanoparticles are in a dispersed state and uniformly dispersed throughout the fluid, the fluid presents a first optical characteristic, but when the nanoparticles are in an aggregated state in which they are gathered into aggregates substantially larger than the individual nanoparticles, the fluid presents a second optical characteristic different from the first optical characteristic. The electrophoretic display further comprises at least one electrode arranged to apply an electric field to the nanoparticle-containing fluid and thereby move the nanoparticles between their dispersed and aggregated states. Various compound particles comprising multiple nanoparticles, alone or in combination with larger objects, and processes for the preparation of such compound particles, are also described.

62 Claims, 17 Drawing Sheets